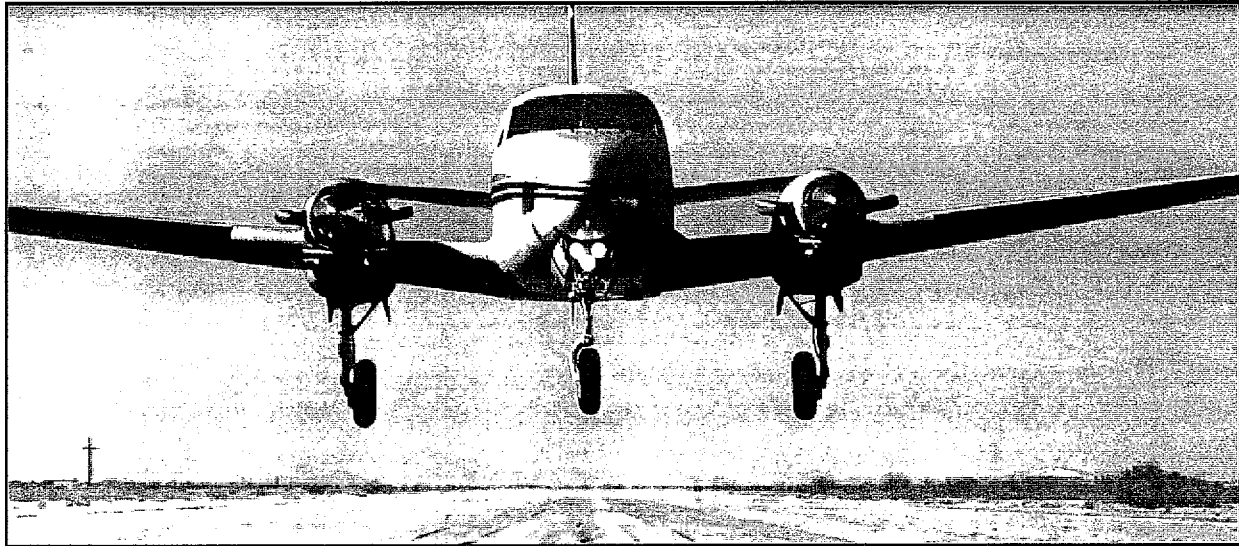


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Chapter Two FORECASTS

FORECASTS



Facility planning must begin with the definition of the demand that may reasonably be expected to occur over the twenty-year planning period. In airport master planning this involves forecasts of aviation activity indicators that define the level of airport demand. Forecasts of based aircraft, based aircraft fleet mix, and annual aircraft operations will be used as the basis for facility planning.

It is virtually impossible to predict with certainty year-to-year fluctuations of activity when looking twenty years into the future. Because aviation activity can be affected by many influences at the local, regional, and national level, it is important to remember that forecasts are to serve only as guidelines and planning must remain flexible enough to respond to unforeseen facility needs. This makes it important to review the airport's activity on a regular basis to determine if

changes to the guidelines are necessary.

The following forecast analysis examines recent developments, historical information, and current aviation trends to provide an updated set of based aircraft and operational projections. The intent is to permit the City of Coolidge to make the planning adjustments necessary to ensure that the facility meets projected demands in an efficient and cost effective manner.

NATIONAL AVIATION TRENDS

Each year, the Federal Aviation Administration (FAA) publishes its national aviation forecast. Included in this publication are forecasts for air carriers, air taxi/commuters, general aviation, and military activity. The

forecasts are prepared to meet budget and planning needs of the constituent units of the FAA and to provide information that can be used by state and local authorities, the aviation industry, and the general public. The current edition is *FAA Aviation Forecasts-Fiscal Years 1996-2007*. The forecasts use the economic performance of the United States as an indicator of future aviation industry growth in the United States. Similar economic analyses are applied to the outlook for aviation growth in international markets.

For the U.S. aviation industry, the outlook for the next twelve years is for moderate to strong economic growth, moderately increasing fuel prices, and moderate inflation. Based on these assumptions, aviation activity by fiscal year 2007 is forecast to increase by 19.5 percent at towered airports and 26.8 percent at air route traffic control centers. The active general aviation fleet is projected to decline for the next few years then begin to rebound for a net increase of 4.9 percent. General aviation hours flown are forecast to increase by 9.9 percent during the same period.

NATIONAL GENERAL AVIATION TRENDS

The general aviation industry is an important contributor to the nation's economy. General aviation includes the production and sale of aircraft, avionics and other equipment, along with the provision of support services such as flight schools, fixed base operators, finance and insurance. In general, general aviation has been in a state of decline for more than a decade.

A number of events have factored into this extended decline in the general aviation industry. These have included the deregulation of the airline industry, increases in airspace restrictions for Visual Flight Rule (VFR) only aircraft, reductions in leisure time, and shifts in personal preferences for goods, services, and leisure time. The overriding factor, however, has been the increased cost in owning and operating a general aviation aircraft.

There are a number of reasons, however, to maintain a favorable outlook of the general aviation industry. One of the primary reasons is the passage of the General Aviation Revitalization Act of 1994. This legislation limits the liability on general aviation aircraft to 18 years from the date of manufacture. This has sparked an interest in aircraft manufacturers to renew the manufacturing of general aviation aircraft due to the reduction in product liability brought about by this legislation. The high cost of product liability insurance was a major factor in the decision to slow (or in some cases) discontinue general aviation aircraft production.

Since the enactment of this legislation in August 1994, Cessna aircraft has committed to resume the production of selected single engine piston aircraft and Piper has announced plans to increase its production level. In addition, the amateur-built aircraft market has shown steady growth over the past several years. General aviation aircraft shipments were up 12.9 percent in 1995 reversing a six-year decline in aircraft shipments. Most notable about this increase was

that it occurred across all aircraft types.

Other reasons for a more favorable long range outlook for general aviation is a growing realization that the industry must "reinvent" itself. As a result, several federal, manufacturer, and industry programs have been initiated. Among these is the FAA's recent streamlining of the small aircraft certification process to include a new entry-level aircraft (Primary Category Rule) that could encourage the production of small, affordable aircraft.

Eleven general aviation organizations have formed a coalition in support of the implementation of the FAA's General Aviation Action Plan. This action plan has goals to seek to provide for regulatory relief and reduced user costs, improved delivery of services through reduced layers of management and more communication, elimination of unneeded programs and processes, and encouragement of product innovation and competitiveness.

Manufacturer and industry programs include the "No Plane No Gain" program promoted jointly by the General Aviation Manufacturers and The National Business Aircraft Association. This program is designed to promote the use of general aviation aircraft as an essential tool of business. Other programs are intended to promote growth in the number of new pilot starts and general flying and introduce people to general aviation. These include the Aircraft Owners and Pilots Association "Project Pilot"; the National Air Transportation Association's "Learn to Fly" program, and the Experimental Aircraft Association's "Young Eagles" program.

The most notable trend in general aviation is the continued strong use of general aviation aircraft for business and corporate uses. In 1994, the number of hours flown by the combined use categories of business and corporate flying represented 23.3 percent of total general aviation activity. In 1990, the number of hours flown by the combined use categories of business and corporate flying represented 21.8 percent of total general aviation activity.

As a result of continued strong use of general aviation aircraft for business and corporate uses, the character of the general aviation fleet has continued to change from a fleet consisting mostly of small piston powered aircraft to a fleet made up of more sophisticated turbine powered aircraft. Reflecting the increasing convenience of general aviation flying to business and their push for more sophisticated, turbine powered aircraft, FAA long-term projections show this segment of general aviation growing more rapidly than all others. FAA forecasts project the active turbine-powered fleet growing 1.5 percent annually through the year 2007. This includes the number of turboprop aircraft growing from 4,207 in 1995 to 5,000 in 2007 and the number of turbojet aircraft increasing from 4,073 in 1995 to 4,900 in 2007.

A trend in the type of general aviation operations at FAA towered airports and the number of general aviation aircraft handled at FAA enroute traffic control has also emerged. General aviation operations at both locations have registered increases in the past two years reflecting an increased use of technologically advanced, sophisticated

aircraft in adverse weather conditions. General aviation instrument operations at towered airports were up 1.9 percent in 1994 and 0.6 percent in 1995. The number of general aviation aircraft handled at en route centers was up 2.7 percent in 1994 and 3.9 percent in 1995.

Overall, the active general aviation aircraft fleet is expected to continue to decline for the short-term, followed by slow growth. The aging piston-engine portion of the active aircraft fleet is the primary reason for the short term decline in active aircraft. The average age of the active aircraft fleet is 27 years with piston aircraft accounting for most of the aging aircraft. Piston aircraft are anticipated to have a net increase of 3,300 units in the active fleet by 2007. **Exhibit 2A** depicts the FAA forecast for active general aviation aircraft in the United States.

AIRPORT SERVICE AREA

The initial step in determining aviation demand for an airport is to define its generalized service area for the various segments of aviation the airport can accommodate. The airport service area is determined primarily by evaluating the location of competing airports, their capabilities and services, and their relative attraction and convenience. With this information, a determination can be made as to how much aviation demand would likely be accommodated by a specific airport.

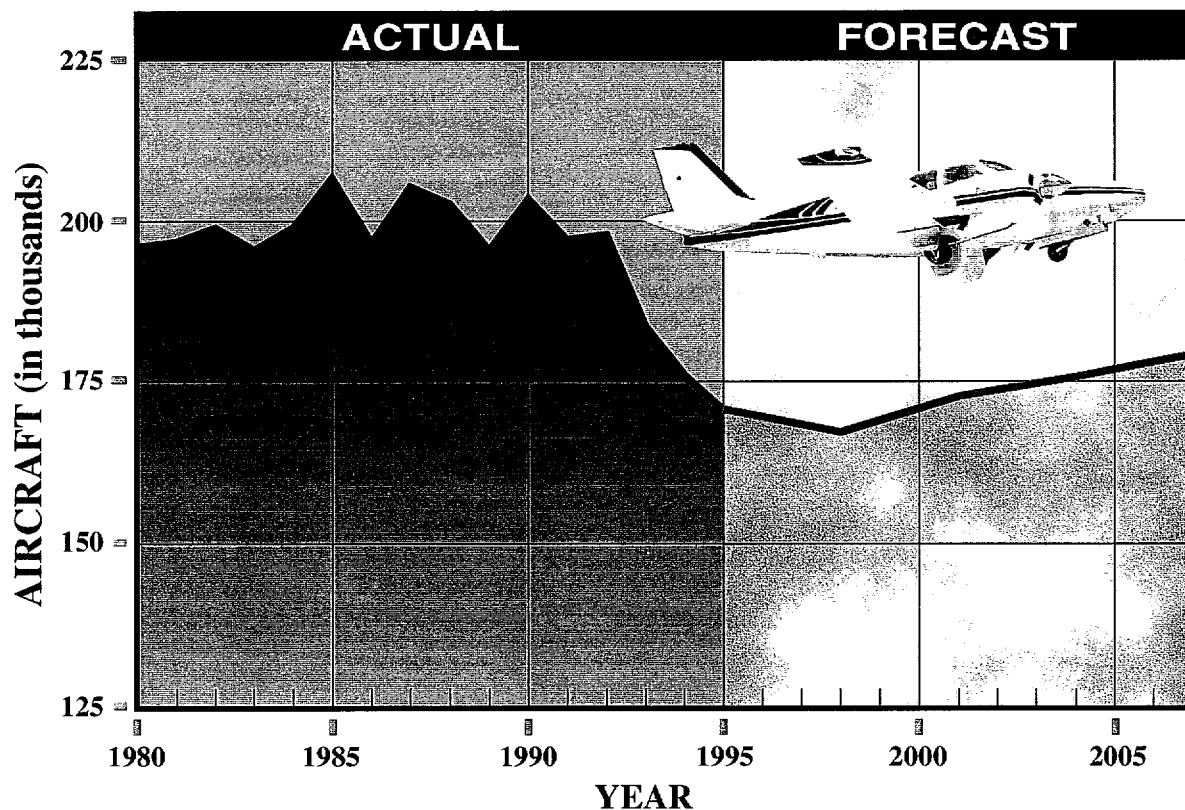
The airport service area is an area where there is a potential market for airport services. Access to general

aviation airports, commercial air service, and transportation networks enter into the equation that determines the size of a service area, as well the quality of aviation facilities, distance, and other subjective criteria.

In determining the aviation demand for an airport it is necessary to identify the role of that airport. The primary role of the Coolidge Municipal Airport is to serve the needs of general aviation. General aviation is a term used to describe a diverse range of aviation activities which includes all segments of the aviation industry except commercial air carriers and military. General aviation is the largest component of the national aviation system and includes activities ranging from pilot training, to recreational flying, and the use of sophisticated turboprop and turbojet aircraft for business and corporate uses.

A description of nearby general aviation airports was previously completed in Chapter One and included descriptions of other central Pinal County public-use airports: Casa Grande Municipal Airport, Eloy Municipal Airport, and Pinal Airpark. The service area for the Coolidge Municipal Airport is limited by the location of these airports and the number of general aviation airports in the Phoenix metropolitan area (50 miles to the north). Effectively, the service area for general aviation services at Coolidge Municipal Airport is limited to the Cities of Coolidge and Florence due to the location of these general aviation airports providing similar general aviation services.

ACTIVE GENERAL AVIATION AIRCRAFT



U.S. ACTIVE GENERAL AVIATION AIRCRAFT (in thousands)

As of January 1	FIXED WING				ROTORCRAFT				
	PISTON		TURBINE				Experimental	Other	Total
	Single-Engine	Multi-Engine	Turboprop	Turbojet	Piston	Turbine			
1995	123.3	15.6	4.2	4.1	1.4	3.0	12.9	6.2	170.6
1998	119.0	15.1	4.4	4.3	1.3	3.0	13.5	6.7	167.3
2001	122.6	15.5	4.6	4.5	1.2	3.0	14.1	7.0	172.5
2004	124.5	15.6	4.8	4.7	1.1	3.0	14.6	7.4	175.7
2007	126.4	15.8	5.0	4.9	1.1	3.0	15.0	7.7	178.9

Source: FAA Aviation Forecasts, Fiscal Years 1996-2007.

Notes: Detail may not add to total because of independent rounding. An active aircraft must have a current registration and it must have been flown at least one hour during the previous calendar year.

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As in any business enterprise, the more attractive the facility is in services and capabilities, the more competitive it will be in the market. As the level of attractiveness expands, so will the service area. If an airport's attractiveness increases in relation to nearby airports, so will the size of the service area. If facilities are adequate and rates and fees are competitive at Coolidge Municipal Airport, some level of general aviation activity might be attracted to the airport from surrounding areas.

POPULATION PROJECTIONS

Local population forecasts provide an indication of the potential for sustaining growth in aviation activity over the planning period. Historical and forecast population estimates for the City of Coolidge and Pinal County were obtained from the Arizona Department of Security and are summarized in Table 2A. Over the past five years the population in both the City of Coolidge and Pinal County has shown a steady year-to-year increase. The population in the City of Coolidge has increased by 80 persons over the past five years, while the population in Pinal County has increased by 19,400 persons. These trends are expected to continue. For the City of Coolidge, the population is projected to grow to 9,534 by the year 2015, an average annual growth rate of 1.5 percent. For Pinal County, the population is projected at 196,925 by the year 2015, an average annual growth rate of 1.8 percent.

TABLE 2A
Historical and Forecast Population
City of Coolidge, Pinal County

Year	City of Coolidge	Pinal County
Historical		
1991	6,975	119,650
1992	7,020	122,600
1993	7,025	127,225
1994	7,035	132,225
1995	7,055	139,050
Forecast		
2000	7,889	154,075
2005	8,439	166,700
2015	9,534	196,925
Source: Arizona Department of Economic Security		

GENERAL AVIATION FORECASTS

To determine the types and sizes of facilities that should be planned to accommodate general aviation activity, certain elements of this activity must be forecast. Indicators of general aviation demand include: based aircraft, the based aircraft fleet mix, general aviation operations, and peak activity. The remainder of this chapter will examine historical trends with regard to these areas of general aviation and project future demand for these segments of general aviation activity at the airport.

BASED AIRCRAFT FORECASTS

The number of based aircraft is the most basic indicator of general aviation

demand at an airport. By first developing a forecast of based aircraft, the growth of aviation activities at the airport can be projected. Historical information regarding based aircraft at the airport was obtained from past FAA 5010 forms. The 5010 Form is a master record used by the FAA and the Arizona Department of Transportation - Aeronautics Division to keep up-to-date information about airports.

Reviewing past FAA 5010 forms for historical information regarding based aircraft revealed that as many as 15 aircraft were based at the airport in the early 1990's when a skydiving operation was located at the airport. Based aircraft have declined in recent years as that skydiving operation has ceased operations at the airport and relocated to another airport due to the large number of military operations that were being conducted at the airport at that time.

In June 1996, it was verified that there is one active aircraft based at the airport year-round. Another aircraft (a MIG 15 military jet) is based at the airport; however, it is being restored and is not operational. Some seasonal variation in based aircraft totals is experienced at the airport and can be attributed to aircraft that may base at the airport only during the winter months. This varies from two to three additional aircraft during the winter months. The number of seasonally-based aircraft and the length of time that they base at the airport was difficult to determine, in part because there are incomplete and unreliable records of the time that these aircraft actually spend at the airport.

While trendline and linear regression analysis methodologies were reviewed for projecting future based aircraft, the small number of existing based aircraft provided a limited sample that could not be used to develop credible forecasts of based aircraft. Therefore, based aircraft projections were developed by examining market share data.

The market share analysis examines the existing and historical percentage of aircraft based at the Coolidge Municipal Airport to total registered aircraft in Pinal County. Historical registered aircraft figures for Pinal County were obtained from the Arizona Department of Aviation, Aeronautics Division and the *FAA Census of U.S. Civil Aircraft* publication. Forecast registered aircraft in Pinal County was obtained from the *1995 Arizona State Aviation Needs Study*. From 1985 to 1995, the number of aircraft registered in Pinal County demonstrated an annual growth rate of 2.9 percent. Total registered aircraft grew by 68 aircraft, from 206 in 1985 to 274 in 1995.

The *1995 Arizona State Aviation Needs Study* projected registered aircraft to grow at an annual rate of 1.4 percent through the year 2015. Total registered aircraft in Pinal County are expected to grow by 90 aircraft, from 274 in 1995 to 364 in 2015. This forecast compares favorably to national forecasts of general aviation aircraft which project a slowing in the growth of the number of general aviation aircraft due to a large number of expected aircraft retirements. The registered aircraft forecasts compare

favorably to forecast population in Pinal County which is expected to grow at an average annual rate of 1.8 percent. **Table 2B** summarizes historical and forecast registered aircraft for Pinal County.

Table 2B also compares historical based aircraft totals at Coolidge Municipal Airport to historical registered aircraft in Pinal County for the period from 1985 to 1995. As a percent of total registered aircraft in Pinal County, based aircraft at Coolidge Municipal Airport has declined most significantly since 1990 after the skydiving operation left the airport. Although based aircraft totals

have declined over the past few years, local economic and population growth as well as the potential for a new skydiving operation to be established at the airport will likely increase the potential for based aircraft growth at the airport. Therefore, it is expected that the airport will attract a slightly larger share of the regional market in the future. This has been reflected in the based aircraft projections for the airport presented in **Table 2B** which projects the airport gradually increasing its share of registered aircraft in Pinal County and eventually reaching the 1985 market share of 6.8 percent by the year 2015.

TABLE 2B Based Aircraft Forecasts Coolidge Municipal Airport			
Year	Pinal County Registered Aircraft ¹	Coolidge Municipal Airport Based Aircraft ²	Percent of Pinal County Registered Aircraft Based at Coolidge
<i>Historical</i>			
1985	206	14	6.80%
1990	245	15	6.12%
1995	274	1	0.36%
<i>Forecast</i>			
2000	297	9	3.0%
2005	321	16	5.0%
2015	364	25	6.8%
¹ 1985 and 1990: U.S. Census of U.S. Civil Aircraft; 1995 and Forecast Years: 1995 Arizona State Aviation Needs Study ² 1985: Coolidge Municipal Airport Master Plan; 1990: FAA Form 5010; 1995: 1995 Arizona State Aviation Needs Study			

Based aircraft projections, developed for the *1995 Arizona State Aviation Needs Study*, were examined for comparison to the based aircraft

projections developed for this master plan study. The *1995 Arizona State Aviation Needs Study* projected based aircraft for the airport through the

year 2015 and projected 10 based aircraft in 2000, 11 based in 2005, and 13 based aircraft in 2015. This projection appears to be conservative considering the growing local population and industrial base in the area. **Exhibit 2B** summarizes the *1995 Arizona State Aviation Needs Study* based aircraft projection and the based aircraft projection developed for this master plan study.

BASED AIRCRAFT FLEET MIX

The based aircraft fleet mix must be known in order to properly size airport facilities. Currently, there is one

single-engine piston aircraft based at the airport year-round. In 1990 (when a skydiving operation was at the airport) there were as many as 11 single-engine piston and four multi-engine piston aircraft based at the airport. It is expected that single-engine piston aircraft will comprise the bulk of based aircraft at the airport in the future. The airport has the ability to accommodate turbine powered aircraft as well. Aircraft that could base at the airport in support of business will tend to be large multi-engine piston, turboprop, or turbojet aircraft. **Table 2C** summarizes the based aircraft fleet mix projection for the airport over the planning period.

TABLE 2C
Based Aircraft Fleet Mix
Coolidge Municipal Airport

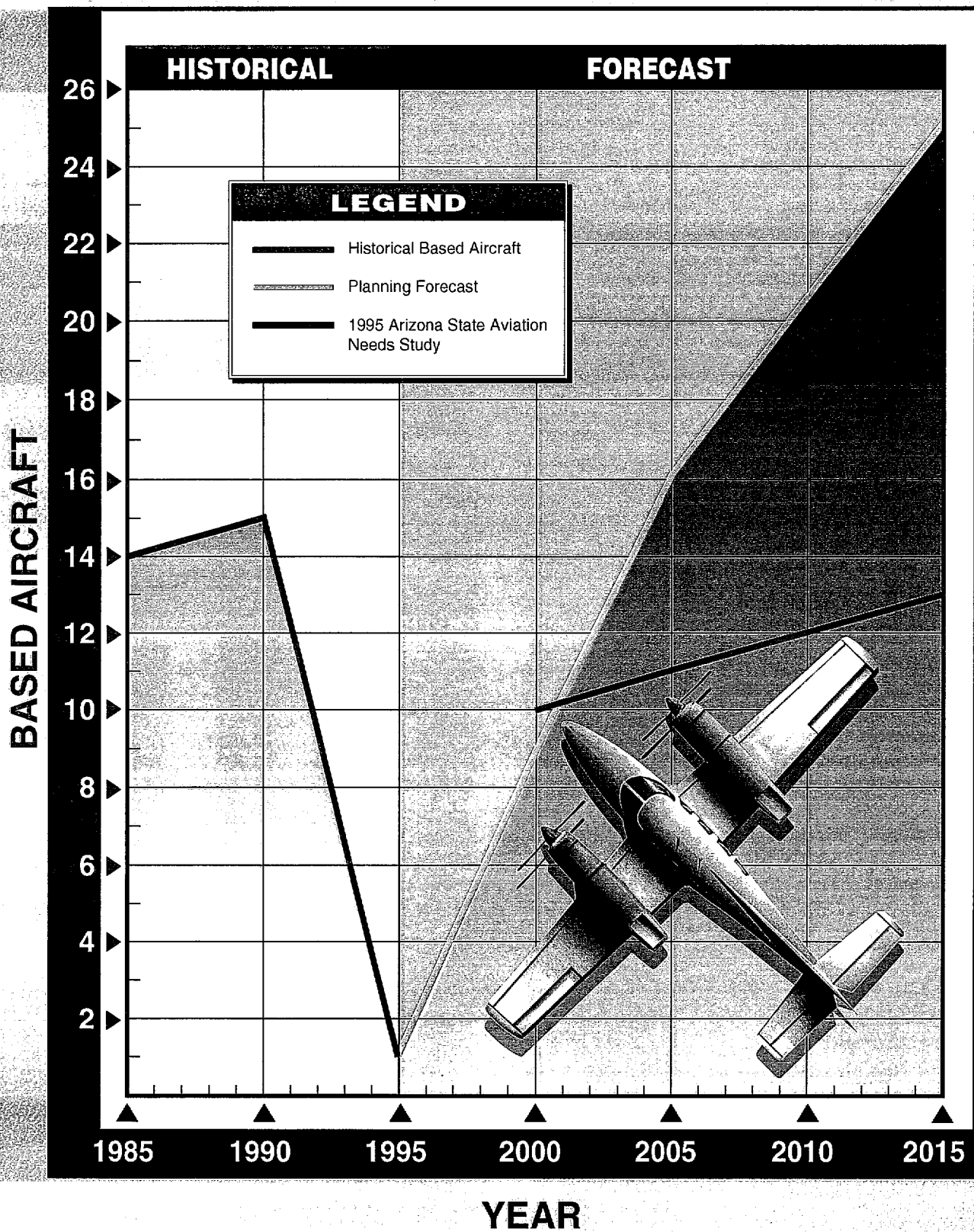
Year	Total	Single-Engine	Multi-Engine	Turboprop	Jet	Rotorcraft
1995	1	1	0	0	0	0
<i>Forecast</i>						
2000	9	6	2	0	1	0
2005	16	10	3	1	1	1
2015	25	16	5	2	1	1

ANNUAL GENERAL AVIATION OPERATIONS

There are two types of general aviation operations at an airport: local and itinerant. A local operation is a take-off or landing performed by an aircraft that operates in the traffic pattern or executes simulated approaches or touch-n-go operations. More simply stated, they are generally training operations. Itinerant operations are

defined as originating or departing aircraft which are not included under the training category. Typically, itinerant operations increase with business and industry use since business aircraft are used primarily to carry people from one location to another.

Due to the absence of an air traffic control tower at the airport, aircraft operations have not been regularly



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counted. Instead, only general estimates of activity based on traffic observations are available. The *1995 Arizona State Aviation Needs Study* estimated that there were 8,513 general aviation operations at Coolidge Municipal Airport in 1995. The *1995 Arizona State Aviation Needs Study* projected general aviation operations for the airport growing to 9,500 by the year 2000, 10,400 by 2005, and 12,300 by 2015. This equates to an average annual growth rate of 1.9 percent, slightly higher than national FAA projections for aircraft utilization of 0.8 percent annually.

Projecting annual operations at the airport using the FAA projection of a 0.8 percent annual growth rate yields 9,000 operations in the year 2000, 9,500 in 2005, and 10,500 in 2015. It would be reasonable to assume that operations at the airport will grow at a rate higher than the national average as based aircraft numbers are projected to increase and it is expected that a skydiving operation may begin operation at the airport. Therefore, the *1995 Arizona State Aviation Needs Study* forecasts are more representative of the expected growth at the airport. **Table 2D** and **Exhibit 2C** present the annual operations forecasts for the airport based upon increasing utilization of aircraft and an increase in the number of based aircraft at the airport.

While the *1995 Arizona State Aviation Needs Study* provided an estimate of 1995 annual operations at the Coolidge Municipal Airport, it did not provide estimates as to the mix of local and itinerant operations. This information has been estimated in the past and recorded on the FAA 5010 Form. The

TABLE 2D
Annual General Aviation
Operations Forecast
Coolidge Municipal Airport

Year	Total Operations
1995 (Est.)	8,513
Forecast	
2000	9,500
2005	10,400
2015	12,300
Source: 1995 Arizona State Aviation Needs Study	

FAA 5010 Form has historically indicated that local operations account for a larger percentage of total annual operations than do itinerant operations. Over the planning period it is expected that the number of local operations will decrease as a percentage of total operations as a result of the expected increased utilization of business and corporate aircraft (which are typically itinerant operations). **Table 2E** presents the local and itinerant operations forecast for the airport over the planning period.

MILITARY ACTIVITY

For the thirty-year period from 1962 to 1992 military training operations from Williams Air Force Base comprised the majority of all operations at the airport. During this period, military operations accounted for nearly 85,000 annual operations at the airport. Training operations from Williams Air Force Base ceased in June 1992 and the joint-use agreement between the Air Force and the City of Coolidge was

terminated in July 1992. Shortly afterward Williams Air Force Base closed. Future military activity at the

airport is expected to be sporadic and comprise less than 100 annual operations.

TABLE 2E
Local and Itinerant Operations Forecast
Coolidge Municipal Airport

Year	Local	Itinerant	Total
2000	5,200	4,300	9,500
2005	5,400	5,000	10,400
2015	5,500	6,800	12,300

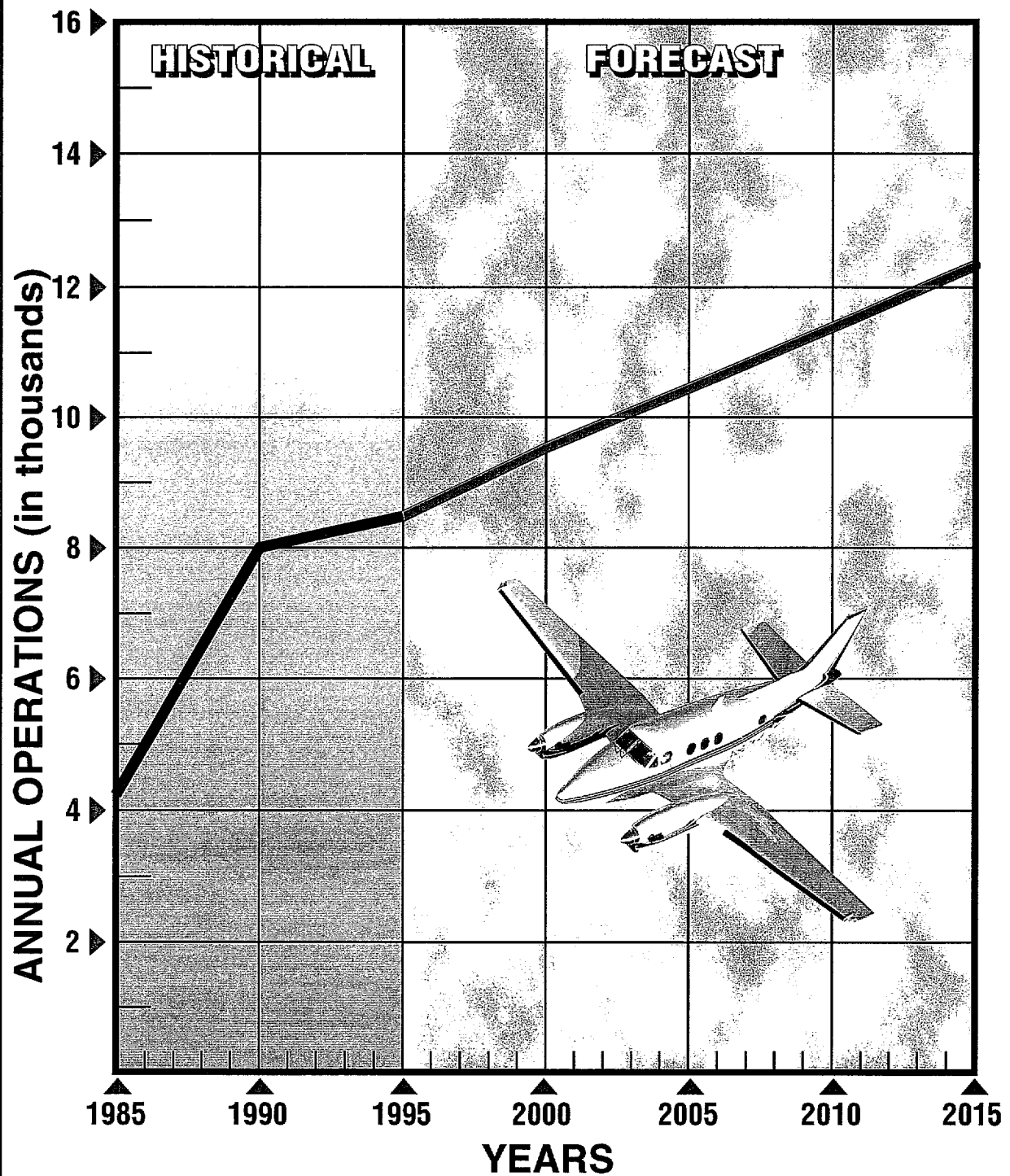
PEAKING CHARACTERISTICS

Many airport facility needs are related to the levels of activity during peak periods. The periods used in developing facility requirements for this study are as follows:



- *Peak Month* - The calendar month when peak aircraft operations occur.
- *Design Day* - The average day in the peak month. Normally this indicator is easily derived by dividing the peak month operations by the number of days in a month.
- *Busy Day* - The busy day of a typical week in the peak month. This descriptor is used primarily to determine apron space requirements.
- *Design Hour* - The peak hour within the design day. This descriptor is used primarily in airfield demand/capacity analyses, and in determining terminal building and access road requirements.

Adequate monthly information is not available to directly determine peak month general aviation activity at the airport. Therefore, peak period forecasts were determined according to trends experienced at similar airports across the county. Typically, the peak month for activity at general aviation airports approximates 10-12 percent of the airport's annual operations. Based on the understanding of current operational levels, peak month operations were estimated at 10 percent of annual operations. The peak month percentage is expected to increase slightly over the planning period as based aircraft and activity increases at the airport. Design day operations were calculated by dividing the peak month by 30.

Based on peaking characteristics from similar airports, the typical busy day was determined by multiplying the design day by twenty percent of weekly operations during the peak month, or 1.4. Design hour operations were determined using 20 percent of the design day operations. Table 2F summarizes the peak activity forecasts for the airport.



LEGEND

-  Historical Operations
-  Master Plan Forecast

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TABLE 2F
Forecast of Peak Activity
Coolidge Municipal Airport

	1995	2000	2005	2015
Annual Operations	8,513	9,500	10,400	12,300
Peak Month	900	1,000	1,100	1,500
Design Day	30	33	37	50
Busy Day	42	47	51	70
Design Hour	6	7	7	10

FORECAST SUMMARY

This chapter has outlined the various aviation demand levels anticipated over the planning period. In summary, general aviation activity at Coolidge Municipal Airport has not followed the national trends. The airport has growth potential, due to a growing local economy and population. In addition, local commercial and industrial growth will influence future activity and based aircraft levels.

The next step in the master plan is to assess the capacity of existing facilities to accommodate forecast demand and determine which facilities will need to be improved to meet these demands. This will be examined in the next chapter -- Chapter 3, Facility Needs Evaluation. **Table 2G** summarizes the forecasts which have been prepared for the Coolidge Municipal Airport.

TABLE 2G
Forecast Summary
Coolidge Municipal Airport

	2000	2005	2015
Based Aircraft	9	16	25
Annual Operations			
Itinerant	4,300	5,000	6,800
Local	<u>5,200</u>	<u>5,400</u>	<u>5,500</u>
Total Annual Operations	9,500	10,400	12,300